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PCT/CA2004/000524
03 April 2004 03.04.04

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Specification and Drawing, as originally filed, with Application for Patent Serial No: **2,425,029**, on April 10, 2003, by **PETER KLAPTCHUK**, for "Apparatus and Method for Microwave Treatment of Organic Matter".

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April 3, 2004
Date

Canada

(CIPO 68)
04-09-02

OPIC CIPO

ABSTRACT

A method of destroying seeds comprises heating the seeds to substantially 95 °C or higher and maintaining same at that temperature for substantially 30 minutes. Preferably a combination of steam and microwaves is used to maintain the temperature. Dampening the seeds with steam and water at the start of the process helps the microwaves work more efficiently in maintaining temperature. An auger conveyor carries the seed through the process. Temperature sensors monitor the temperature of the seeds and control the speed of the auger so that the seeds are maintained at substantially 95 °C for substantially 30 minutes prior to exiting the output end of the auger conveyor. The auger continuously agitates the seed to expose the seeds to the microwaves

METHOD OF DESTROYING SEEDS

This invention is in the field of seeds, and in particular the destruction of seeds to ensure that the seeds do not germinate or reproduce.

BACKGROUND

Destruction of seeds to prevent germination and reproduction thereof is presently an issue of concern. Genetic modification of seed has received an adverse reaction from a significant portion of the public. The possibility that experimental seed could escape into the environment is a concern, and companies engaged in research into such seeds wish to be able to ensure to the public that such escape will not occur.

Thus companies engaged in seed research cannot simply discard experimental seed that is not needed, but must ensure that the germinal viability of the seed is destroyed. Grinding or crushing seed using methods of the prior art cannot guarantee that some germination can remain viable. Small seeds, such as canola, are especially difficult to pulverize effectively to destroy viability. Incineration produces undesirable by-products and emissions drift over the environment.

Although genetically modified seeds are most in the public awareness, it is contemplated that other conventionally bred seeds, or undesirable seeds found in nature such as various weeds, or like seeds would beneficially be destroyed.

SUMMARY OF THE INVENTION

It is the object of the present invention to provide a method of destroying seed that ensures that the seeds will not reproduce. It is a further object of the present invention to provide such a method that transforms the seed into a product that may be environmentally safely disposed of.

The invention provides a method of destroying seeds. The seeds are heated to substantially 95 °C and maintained at that temperature for substantially 30 minutes. Preferably a combination of steam and microwaves is used to maintain the temperature. Dampening the seeds with steam at the intake end of the process helps the microwaves work more efficiently in maintaining temperature. An auger conveyor carries the seed through the process. Temperature sensors monitor the temperature of the seeds and control the speed of the auger so that the seeds are maintained at substantially 95 °C for substantially 30 minutes prior to exiting the output end of the auger conveyor. The auger continuously agitates the seed to expose the seeds to the microwaves.

Using the controlled speed auger, the process is continuous, allowing for considerable [illegible] oversight of the process is possible.

DESCRIPTION OF THE DRAWINGS:

While the invention is claimed in the concluding portions hereof, preferred embodiments are provided in the accompanying detailed description which may be best understood in conjunction with the accompanying diagrams where like parts in each of the several diagrams are labeled with like numbers, and where:

Fig. 1 is a schematic side view of an apparatus for practicing a method of the invention.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS:

Fig. 1 schematically illustrates an apparatus 10 for practicing a method of the invention for destroying seeds to prevent further germination and reproduction from them. The seeds are placed into a hopper 1, where steam at 250 - 400 °C from a boiler 5 and water from a water source 6 are added to heat and dampen the seeds.

The seeds flow from the hopper into a steam chamber 3. Steam is conducted from the boiler 5 into the steam chamber 3, thereby further raising the temperature of the seed and further wetting the seed somewhat.

A shredder roller 9 may be placed in the bottom of the hopper 1 to break up the seed surface and allow the steam to penetrate the seed more readily. Some seeds are known to have less permeable outer skins that resist dampening, and breaking up the surface helps the steam to penetrate.

At the bottom of the steam chamber 3 the seed flows into the intake of an auger conveyor 7. Further steam from the boiler 5 is added near the intake of the auger conveyor 7. At this point the temperature of the seed has been raised to near 95 °C. Temperature sensors 13 begin to monitor the temperature of the seeds. Microwave generators 11 further heat the seeds. Once the seed temperature reaches substantially 95 °C, the system adjusts the speed of the auger such that the seed temperature is maintained at substantially 95 °C or higher for substantially 30 minutes prior to exiting the auger conveyor.

Steam could also be used to maintain the temperature of the seed, for example by encircling the auger with steam lines. It is however preferred to use a series of microwave generators 11 to maintain the seed temperature at substantially 95 °C or higher. The microwaves work efficiently on the dampened seeds to economically maintain the required temperature, and add their own destructive effects to the process.

If the temperature of the seed in the auger conveyor 7 is sensed by the sensors 13 to be dropping, the auger speed can be reduced so that the seed moves slower, and thus receives more heat from the microwaves. In this manner each seed is maintained in the auger conveyor 7 for at least substantially 30 minutes, and perhaps longer, and is maintained at the required substantially 95 °C or higher temperature while it is in the auger conveyor 7.

Once the seeds exit the auger conveyor 7, tests have shown that seed viability and germination is zero. The destroyed seeds exiting the auger conveyor 7 can be safely disposed of. In fact the destroyed seeds can be readily composted, and sold if desired.

The process is continuous, and thus requires no intervention. Seed can be fed into the hopper 1 continuously through another auger conveyor sealed to the cover of the hopper 1. Steam is restricted from escaping through the second auger conveyor by seeds in the auger. The hopper 1 could also be sized to contain a large batch that seldom requires filling. The destroyed seeds can likewise be transported away continuously, or in batches.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous changes and modifications will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation

shown and described, and accordingly, all such suitable changes or modifications in structure or operation which may be resorted to are intended to fall within the scope of the claimed invention.

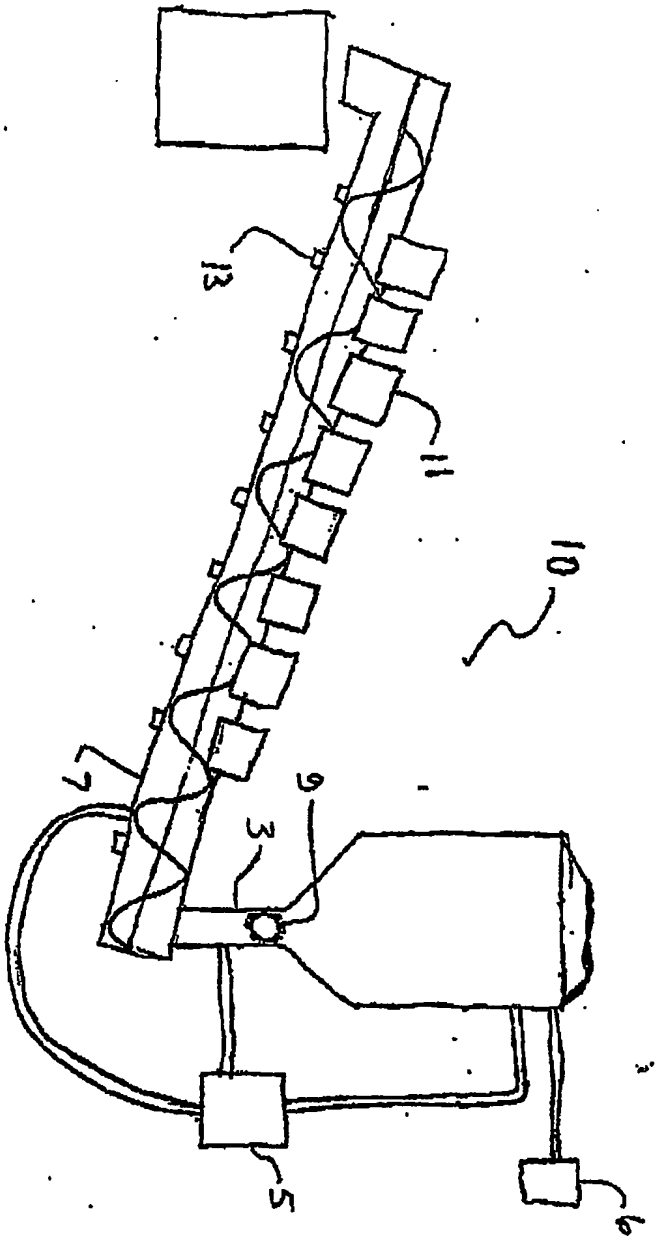

FIG. 1